

IM-945GC / IM-945GC-D

MS-9832 (V1.X) Mainboard



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Revision History

Revision	Revision History	Date
V1.0	First release	September 2008

Technical Support

If a problem arises with your system and no solution can be obtained from the user's manual, please contact your place of purchase or local distributor. Alternatively, please try the following help resources for further guidance.

🔍 Visit the MSI website at <http://global.msi.com.tw/index.php?func=service> for FAQ, technical guide, BIOS updates, driver updates, and other information.

📞 Contact our technical staff at <http://ocss.msi.com.tw>.

Safety Instructions

1. Always read the safety instructions carefully.
2. Keep this User's Manual for future reference.
3. Keep this equipment away from humidity.
4. Lay this equipment on a reliable flat surface before setting it up.
5. The openings on the enclosure are for air convection hence protects the equipment from overheating. **DO NOT COVER THE OPENINGS.**
6. Make sure the voltage of the power source and adjust properly 110/220V before connecting the equipment to the power inlet.
7. Place the power cord such a way that people can not step on it. Do not place anything over the power cord.
8. Always Unplug the Power Cord before inserting any add-on card or module.
9. All cautions and warnings on the equipment should be noted.
10. Never pour any liquid into the opening that could damage or cause electrical shock.
11. If any of the following situations arises, get the equipment checked by service personnel:
 - ▶ The power cord or plug is damaged.
 - ▶ Liquid has penetrated into the equipment.
 - ▶ The equipment has been exposed to moisture.
 - ▶ The equipment does not work well or you can not get it work according to User's Manual.
 - ▶ The equipment has dropped and damaged.
 - ▶ The equipment has obvious sign of breakage.
12. **DONOT LEAVE THIS EQUIPMENT INAN ENVIRONMENT UNCONDITIONED, STORAGE TEMPERATURE ABOVE 60°C (140°F), IT MAY DAMAGE THE EQUIPMENT.**



CAUTION: Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer.



警告使用者：

此為甲類資訊技術設備，於居住環境中使用時，可能會造成射頻擾動，在此情況下，使用者會被要求採取某些適當的對策



廢電池請回收

For better environmental protection, waste batteries should be collected separately for recycling or special disposal.

FCC-B Radio Frequency Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part



N1996

15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the measures listed below.

- ▶ Reorient or relocate the receiving antenna.
- ▶ Increase the separation between the equipment and receiver.
- ▶ Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- ▶ Consult the dealer or an experienced radio/television technician for help.

Notice 1

The changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Notice 2

Shielded interface cables and A.C. power cord, if any, must be used in order to comply with the emission limits.

VOIR LA NOTICE D'INSTALLATION AVANT DE RACCORDER AU RESEAU.



**Micro-Star International
MS-9832**

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) this device may not cause harmful interference, and*
- (2) this device must accept any interference received, including interference that may cause undesired operation.*

WEEE (Waste Electrical and Electronic Equipment) Statement



ENGLISH

To protect the global environment and as an environmentalist, MSI must remind you that...

Under the European Union ("EU") Directive on Waste Electrical and Electronic Equipment, Directive 2002/96/EC, which takes effect on August 13, 2005, products of "electrical and electronic equipment" cannot be discarded as municipal waste anymore and manufacturers of covered electronic equipment will be obligated to take back such products at the end of their useful life. MSI will comply with the product take back requirements at the end of life of MSI-branded products that are sold into the EU. You can return these products to local collection points.

DEUTSCH

Hinweis von MSI zur Erhaltung und Schutz unserer Umwelt

Gemäß der Richtlinie 2002/96/EG über Elektro- und Elektronik-Altgeräte dürfen Elektro- und Elektronik-Altgeräte nicht mehr als kommunale Abfälle entsorgt werden. MSI hat europaweit verschiedene Sammel- und Recyclingunternehmen beauftragt, die in die Europäische Union in Verkehr gebrachten Produkte, am Ende seines Lebenszyklus zurückzunehmen. Bitte entsorgen Sie dieses Produkt zum gegebenen Zeitpunkt ausschliesslich an einer lokalen Altgerätesammelstelle in Ihrer Nähe.

FRANÇAIS

En tant qu'écologiste et afin de protéger l'environnement, MSI tient à rappeler ceci...

Au sujet de la directive européenne (EU) relative aux déchets des équipement électriques et électroniques, directive 2002/96/EC, prenant effet le 13 août 2005, que les produits électriques et électroniques ne peuvent être déposés dans les décharges ou tout simplement mis à la poubelle. Les fabricants de ces équipements seront obligés de récupérer certains produits en fin de vie. MSI prendra en compte cette exigence relative au retour des produits en fin de vie au sein de la communauté européenne. Par conséquent vous pouvez retourner localement ces matériels dans les points de collecte.

РУССКИЙ

Компания MSI предпринимает активные действия по защите окружающей среды, поэтому напоминаем вам, что...

В соответствии с директивой Европейского Союза (ЕС) по предотвращению загрязнения окружающей среды использованным электрическим и электронным оборудованием (директива WEEE 2002/96/EC), вступающей в силу 13 августа 2005 года, изделия, относящиеся к электрическому и электронному оборудованию, не могут рассматриваться как бытовой мусор, поэтому производители вышеперечисленного электронного оборудования обязаны принимать его для переработки по окончании срока службы. MSI обязуется соблюдать требования по приему продукции, проданной под маркой MSI на территории ЕС, в переработку по окончании срока службы. Вы можете вернуть эти изделия в специализированные пункты приема.

ESPAÑOL

MSI como empresa comprometida con la protección del medio ambiente, recomienda:

Bajo la directiva 2002/96/EC de la Unión Europea en materia de desechos y/o equipos electrónicos, con fecha de rigor desde el 13 de agosto de 2005, los productos clasificados como "eléctricos y equipos electrónicos" no pueden ser depositados en los contenedores habituales de su municipio, los fabricantes de equipos electrónicos, están obligados a hacerse cargo de dichos productos al término de su período de vida. MSI estará comprometido con los términos de recogida de sus productos vendidos en la Unión Europea al final de su período de vida. Usted debe depositar estos productos en el punto limpio establecido por el ayuntamiento de su localidad o entregar a una empresa autorizada para la recogida de estos residuos.

NEDERLANDS

Om het milieu te beschermen, wil MSI u eraan herinneren dat....

De richtlijn van de Europese Unie (EU) met betrekking tot Vervuiling van Elektrische en Electronische producten (2002/96/EC), die op 13 Augustus 2005 in zal gaan kunnen niet meer beschouwd worden als vervuiling.

Fabrikanten van dit soort producten worden verplicht om producten retour te nemen aan het eind van hun levenscyclus. MSI zal overeenkomstig de richtlijn handelen voor de producten die de merknaam MSI dragen en verkocht zijn in de EU. Deze goederen kunnen geretourneerd worden op lokale inzamelingspunten.

SRPSKI

Da bi zaštitili prirodnu sredinu, i kao preduzeće koje vodi računa o okolini i prirodnoj sredini, MSI mora da vas podestiti da...

Po Direktivi Evropske unije ("EU") o odbačenju električnih i električne opreme, Direktiva 2002/96/EC, koja stupa na snagu od 13. Avgusta 2005, proizvodi koji spadaju pod "elektronsku i električnu opremu" ne mogu više biti odbačeni kao običan otpad i proizvođači ove opreme biće prinuđeni da uzmu natrag ove proizvode na kraju njihovog uobičajenog veka trajanja. MSI će poštovati zahtev o preuzimanju ovakvih proizvoda kojima je istekao vek trajanja, koji imaju MSI oznaku i koji su prodati u EU. Ove proizvode možete vratiti na lokalnim mestima za prikupljanje.

POLSKI

Aby chronić nasze środowisko naturalne oraz jako firma dbająca o ekologię, MSI przypomina, że...

Zgodnie z Dyrektywą Unii Europejskiej ("UE") dotyczącą odpadów produktów elektrycznych i elektronicznych (Dyrektywa 2002/96/EC), która wchodzi w życie 13 sierpnia 2005, tzw. "produkty oraz wyposażenie elektryczne i elektroniczne" nie mogą być traktowane jako śmieci komunalne, tak więc producenci tych produktów będą zobowiązani do odbierania ich w momencie gdy produkt jest wycofywany z użycia. MSI wypełni wymagania UE, przyjmując produkty (sprzedawane na terenie Unii Europejskiej) wycofywane z użycia. Produkty MSI będzie można zwracać w wyznaczonych punktach zbiorczych.

TÜRKÇE

Çevreci özelliğiyle bilinen MSI dünyada çevreyi korumak için hatırlatır:

Avrupa Birliği (AB) Kararnamesi Elektrik ve Elektronik Malzeme Atığı, 2002/96/EC Kararnamesi altında 13 Ağustos 2005 tarihinden itibaren geçerli olmak üzere, elektrikli ve elektronik malzemeler diğer atıklar gibi çöpe atılamayacak ve bu elektronik cihazların üreticileri, cihazların kullanım süreleri bittikten sonra ürünleri geri toplamakla yükümlü olacaktır. Avrupa Birliği'ne satılan MSI markalı ürünlerin kullanım süreleri bittiğinde MSI ürünlerin geri alınması isteği ile işbirliği içerisinde olacaktır. Ürünlerinizi yerel toplama noktalarına bırakabilirsiniz.

ČESKY

Záleží nám na ochraně životního prostředí - společnost MSI upozorňuje...

Podle směrnice Evropské unie ("EU") o likvidaci elektrických a elektronických výrobků 2002/96/EC platné od 13. srpna 2005 je zakázáno likvidovat "elektrické a elektronické výrobky" v běžném komunálním odpadu a výrobci elektronických výrobků, na které se tato směrnice vztahuje, budou povinni odebírat takové výrobky zpět po skončení jejich životnosti. Společnost MSI splní požadavky na odebrání výrobků značky MSI, prodávaných v zemích EU, po skončení jejich životnosti. Tyto výrobky můžete odevzdat v místních sběrnách.

MAGYAR

Annak érdekében, hogy környezetünket megvédjük, illetve környezetvédként fellépve az MSI emlékezteti Önt, hogy ...

Az Európai Unió („EU”) 2005. augusztus 13-án hatályba lépő, az elektromos és elektronikus berendezések hulladékairól szóló 2002/96/EK irányelve szerint az elektromos és elektronikus berendezések többé nem kezelhetők lakossági hulladékként, és az ilyen elektronikus berendezések gyártói kötelessé válnak az ilyen termékek visszavételére azok hasznos élettartama végén. Az MSI betartja a termékvisszavétellel kapcsolatos követelményeket az MSI márkánév alatt az EU-n belül értékesített termékek esetében, azok élettartamának végén. Az ilyen termékeket a legközelebbi gyűjtőhelyre viheti.

ITALIANO

Per proteggere l'ambiente, MSI, da sempre amica della natura, ti ricorda che....

In base alla Direttiva dell'Unione Europea (EU) sullo Smaltimento dei Materiali Elettrici ed Elettronici, Direttiva 2002/96/EC in vigore dal 13 Agosto 2005, prodotti appartenenti alla categoria dei Materiali Elettrici ed Elettronici non possono più essere eliminati come rifiuti municipali: i produttori di detti materiali saranno obbligati a ritirare ogni prodotto alla fine del suo ciclo di vita. MSI si adegnerà a tale Direttiva ritirando tutti i prodotti marchiati MSI che sono stati venduti all'interno dell'Unione Europea alla fine del loro ciclo di vita. È possibile portare i prodotti nel più vicino punto di raccolta.

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Chapter 1

Product Overview

Thank you for choosing the IM-945GC / IM-945GC-D (MS-9832 v1.X) Mini ITX mainboard from MSI.

Based on the innovative **Intel® 945GC & ICH7** controllers for optimal system efficiency, the IM-945GC / IM-945GC-D accommodates the latest Intel® Atom™ processor, single-core (230) & dual-core (330) (Diamondville) and supports one DDR2 533/667/800 DIMM slot to provide the maximum of 2GB memory capacity.

In the entry-level and mid-range market segment, the IM-945GC / IM-945GC-D can provide a high-performance solution for today's front-end and general purpose workstation, as well as in the future.

Mainboard Specifications

Processor

- Intel Atom processor, single-core (230) & dual-core (330) (Diamondville)

FSB

- 533MHz

Chipset

- Northbridge: Intel 945GC chipset
- Southbridge: Intel ICH7 chipset

Memory

- 1 unbuffered non-ECC DDR2 533/667/800 DIMM slot
- Up to 2GB memory capacity

LAN

- Supports Gigabit Ethernet by Realtek RTL8111C

Audio

- HDA Codec by Realtek ALC888 7.1 channel
- Compliant with Azalia 1.0 specs

IDE

- 1 IDE port by Intel ICH7
- Supports Ultra DMA 66/100 mode
- Supports PIO, Bus Master operation mode

SATA

- 4 SATAII ports by Intel ICH7
- Supports 4 SATAII devices
- Supports up to 3Gb/s data transfer rate

Graphics

- Onboard graphics integrated in Intel 945GC

NOTE: When assembling a system with this mainboard, make sure that you install a system fan to prevent the system from overheating.

Connectors

► Back Panel

- 1 PS/2 mouse port
- 1 PS/2 keyboard port
- 3 serial ports
- 1 VGA port
- 2 Gigabit LAN jacks
- 4 USB 2.0 ports
- 3 audio jacks

► Onboard Connectors

- 1 front panel audio pinheader
- 1 USB 2.0 pinheader (2 ports)
- 3 serial port connectors
- 1 SPI Flash ROM pinheader (for debugging)
- 1 chassis intrusion switch pinheader

Slots

- 1 Mini PCI-E slot
- 1 32-bit/33MHz PCI slot

Form Factor

- Mini ITX: 170mm x 170mm

Mounting

- 4 mounting holes

Environmental

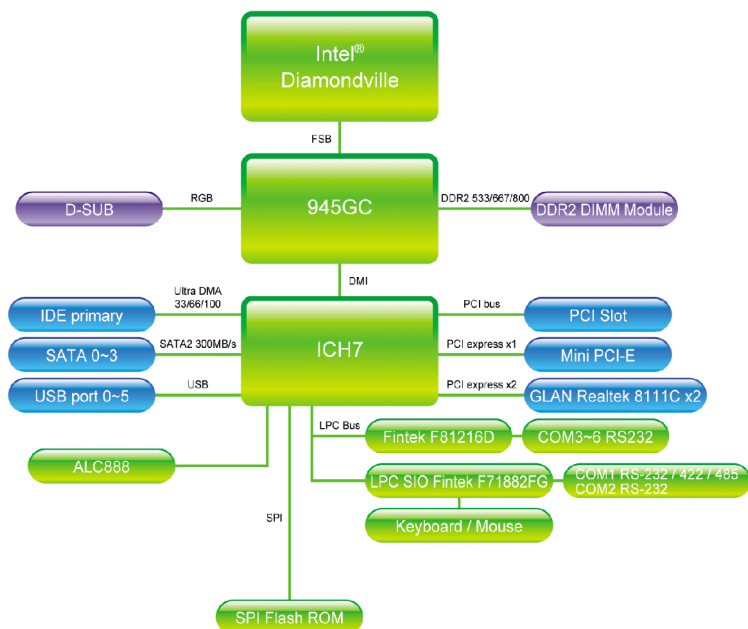
► Storage Environment

- Temperature: -20°C ~ 80°C
- Humidity: 5% ~ 90% non condensing

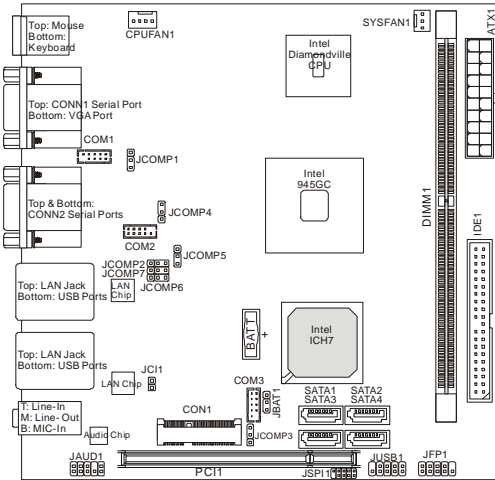
► Operation Environment

- Temperature: 0°C ~ 60°C
- Humidity: 5% ~ 90% non condensing

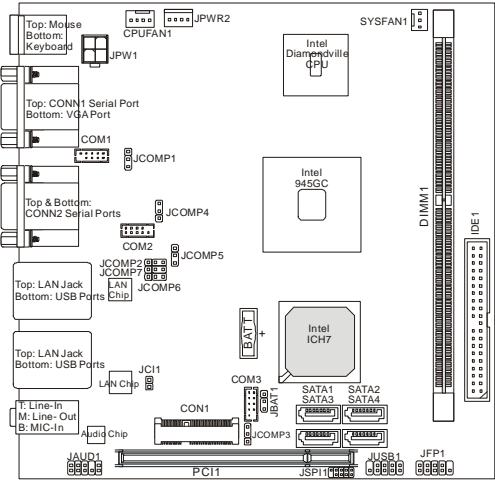
Block Diagram



Mainboard Layout

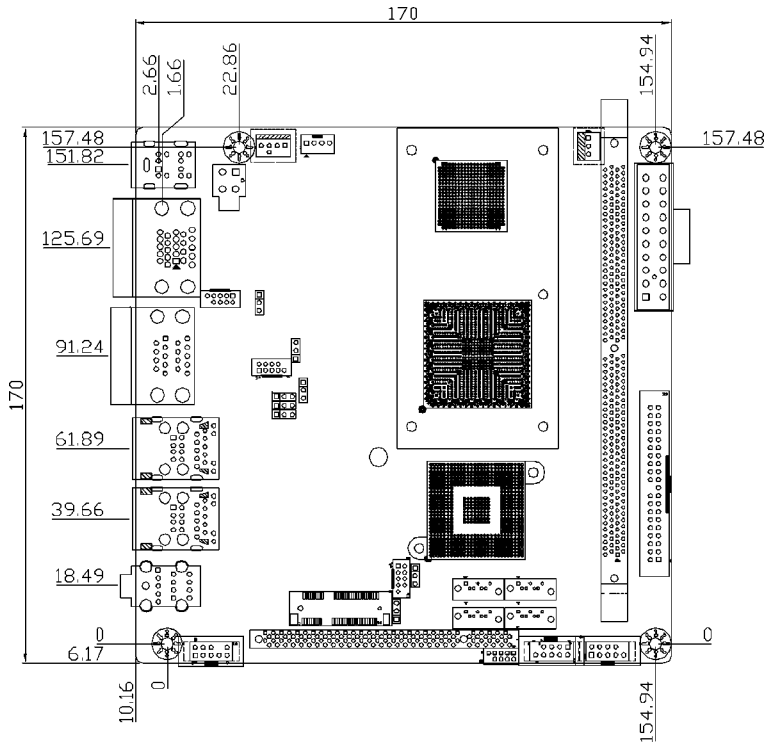


IM-945GC (MS-9832 v1.X) Mini ITX Mainboard

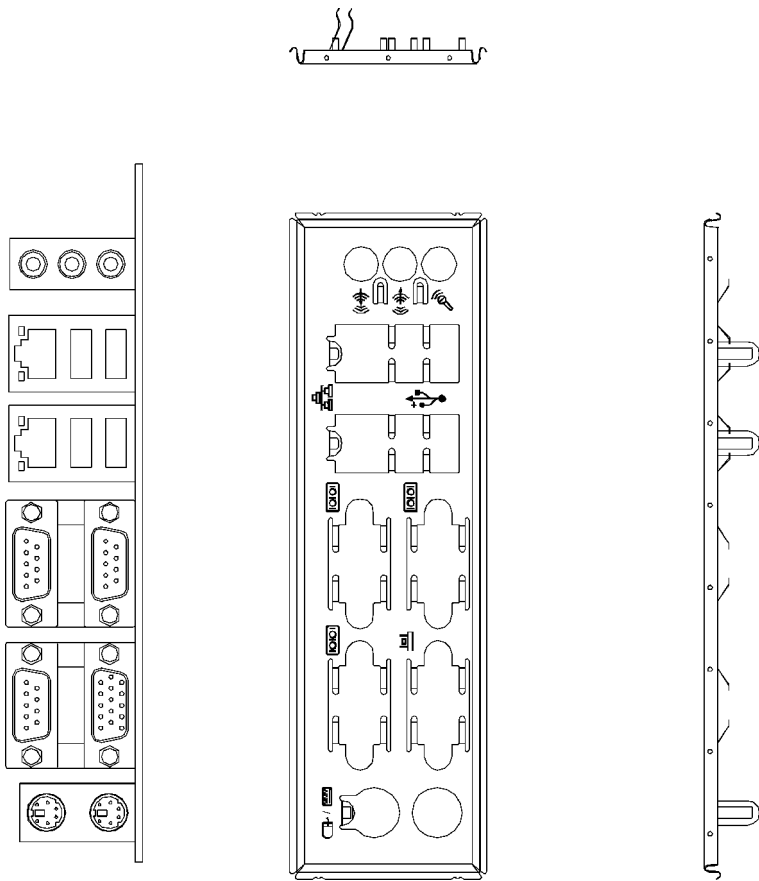


IM-945GC-D (MS-9832 v1.X) Mini ITX Mainboard

Board Dimension



Back Panel & I/O Shield Drawing



Power Consumption

Component	Description
CPU	Intel® Atom™ Processor 200 Series
Memory	Corsair 1G DDR2-800 x1
Add-On VGA	NA
Hard Disk	Western 80G IDE 7200rpm HDD x1
Operating system	Microsoft® Windows XP® Professional SP2

MS-9832 (ATX)	3.3V input	5V input	12V input	5VSB	Total Watt
	Current (A)	Current (A)	Current (A)	Current (A)	Watt
Enter DOS (Stable)	0.58	0.47	0.11	0.05	5.834W
Enter BIOS (Stable)	0.58	0.48	0.09	0.05	5.644W
Idle	0.41	0.50	1.04	0.05	16.583W
CPU Stress 100%	0.59	0.63	1.15	0.05	19.147W
Windows stress(3dMARK2006)	0.59	1.10	1.50	0.05	25.697W
Windows Desktop Standby S1 without LAN connected (stable)	0.43	0.46	0.80	0.02	13.419W
Windows Desktop Standby S3 without LAN connected (stable)	0	0	0	0.28	1.4W
Windows Desktop Hibernate S4 without LAN connected (stable)	0	0	0	0.15	0.75W
Windows Desktop Soft Off S5 without LAN connected (stable)	0	0	0	0.15	0.75W

Component	Description
CPU	Intel® Atom™ Processor 200 Series
Memory	Corsair 1G DDR2-800 x1
Add-On VGA	NA
Hard Disk	Western 80G IDE 7200rpm HDD x1
Operating system	Microsoft® Windows XP® Professional SP2

MS-9832 (DC)	12V input	
	Current(A)	Watt
Enter DOS (Stable)	1.613 A	19.356W
Enter BIOS (Stable)	1.600 A	19.200W
Idle	1.578 A	18.936W
CPU Stress 100%	1.760 A	21.120W
Windows stress(3dMARK2006)	2.213 A	26.556W
Windows Desktop Standby S1 without LAN connected (stable)	1.270 A	15.240W
Windows Desktop Standby S3 without LAN connected (stable)	0.240 A	2.880W
Windows Desktop Hibernate S4 without LAN connected (stable)	0.175 A	2.100W
Windows Desktop Soft Off S5 without LAN connected (stable)	0.188 A	2.256W

Safety Compliance & MTBF

Certification	Standard number		Title of standard
CE	RFI	EN 55022: 2006	Product family standard
		EN 2006	Limits for harmonic current emission
		EN 1995+A1:2001+A2:2005	Limitation of voltage fluctuation and flicker in low-voltage supply system
	Immunity	EN 55024:1998+A1:2001+A2:2003	Product family standard
BSMI	CNS 13438 乙類(1995年6月版)		
C-Tick	AS/NZS CISPR 22:2006		
FCC	FCC CFR Title 47 Part 15 Subpart B: 2005 Class B		
	CISPR 22: 2006		
VCCI	VCCI V-3:2008 Class B		
	VCCI V-4:2008 Class B		

9832-01S MTBF - Reliability Prediction

Calculation Model	Operation Temperature (°C)	Operating Environment	Duty Cycle (FITs.)	MTBF (hr.)
Telcordia Issue 1	25	GB, GC - Ground Benign, Controlled	3,480.218071	287,338

9832-02S MTBF - Reliability Prediction

Calculation Model	Operation Temperature (°C)	Operating Environment	Duty Cycle (FITs.)	MTBF (hr.)
Telcordia Issue 1	25	GB, GC - Ground Benign, Controlled	3,657.522543	273,409

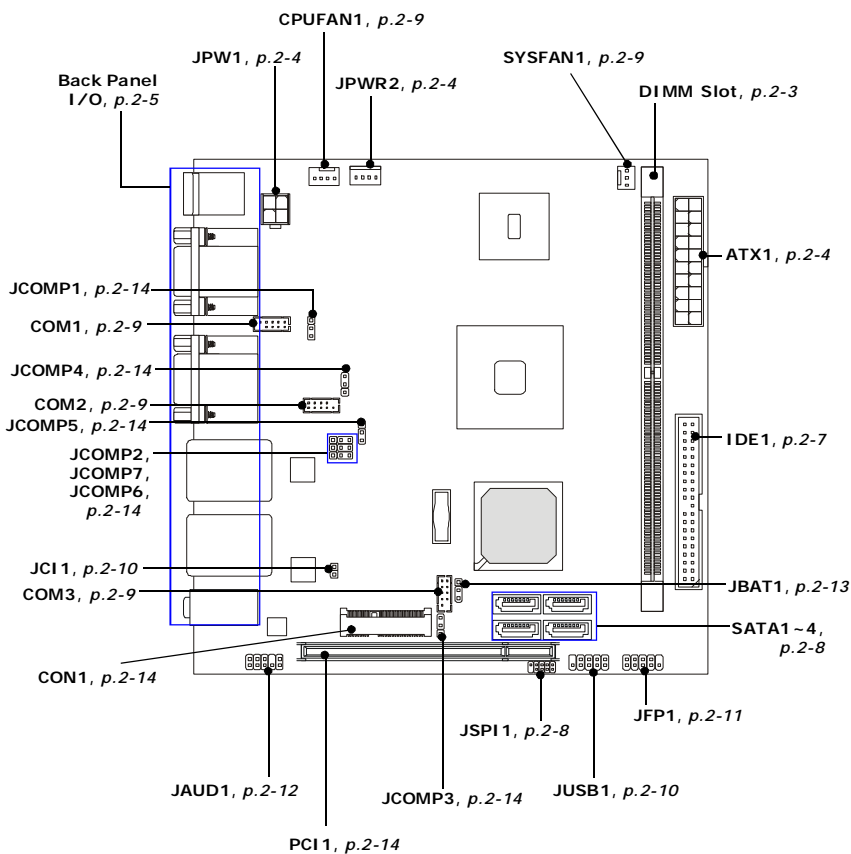
Chapter 2

Hardware Setup

This chapter provides you with the information about hardware setup procedures. While doing the installation, be careful in holding the components and follow the installation procedures. For some components, if you install in the wrong orientation, the components will not work properly.

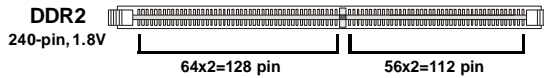
Use a grounded wrist strap before handling computer components. Static electricity may damage the components.

Quick Components Guide



Memory

These DIMM slots are intended for system memory modules.



Installing Memory Modules

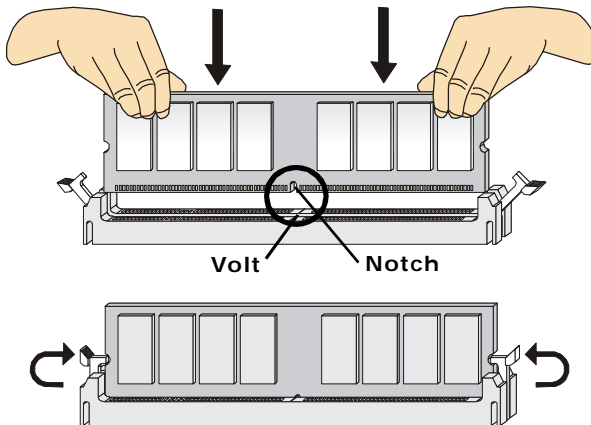
1. Locate the DIMM slots on the mainboard. Flip open the retaining clip at each side of the DIMM slot.
2. Align the notch on the DIMM with the key on the slot. Insert the DIMM vertically into the DIMM slot. Then push it in until the golden finger on the DIMM is deeply inserted in the DIMM slot. The retaining clip at each side of the DIMM slot will automatically close if the DIMM is properly seated.



Important

You can barely see the golden finger if the DIMM is properly inserted in the DIMM slot.

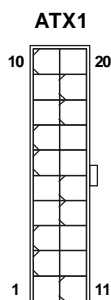
3. Manually check if the DIMM has been locked in place by the retaining clips at the sides.



Power Supply

System Power Connector: ATX1 (for IM-945GC)

This connector allows you to connect a 20-pin power supply. To connect the power supply, make sure the power supply connector is inserted in the proper orientation and the pins are aligned. Then push down the power supply firmly into the connector.

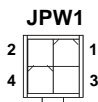


Pin Definition

PIN	SIGNAL	PIN	SIGNAL
1	+3.3V	11	+3.3V
2	+3.3V	12	-12V
3	GND	13	GND
4	+5V	14	PS-ON#
5	GND	15	GND
6	+5V	16	GND
7	GND	17	GND
8	PWROK	18	Res
9	5VSB	19	+5V
10	+12V	20	+5V

System Power Connector: JPW1 (for IM-945GC-D)

This 12V power connector is used to provide power to the system & CPU.



Pin Definition

PIN	SIGNAL
1	GND
2	GND
3	12V
4	12V

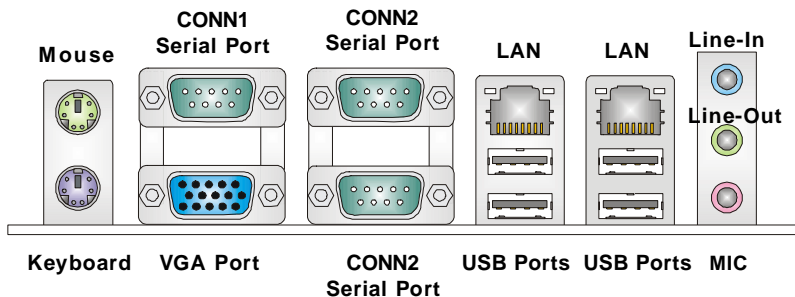
SATA HDD Power Connector: JPWR2 (for IM-945GC-D)

These connectors provide power to the SATA hard disk drives.

JPWR2



Back Panel I/O



► Mouse/Keyboard

The standard PS/2® mouse/keyboard DIN connector is for a PS/2® mouse/keyboard.

► Serial Port

The serial port is a 16550A high speed communications port that sends/ receives 16 bytes FIFOs. You can attach a serial mouse or other serial devices directly to the connector.

► VGA Port

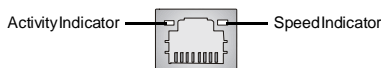
The DB15-pin female connector is provided for monitor.

► USB Port

The USB (Universal Serial Bus) port is for attaching USB devices such as keyboard, mouse, or other USB-compatible devices.

► LAN

The standard RJ-45 LAN jack is for connection to the Local Area Network (LAN). You can connect a network cable to it.



		Left LED	Right LED
LED Color		Active LED	100M/1000M Speed LED
		Yellow	Green/Orange
10M Cable Plug-in	No Transmission	Slow Blinking	OFF
	Transition	Swiftly Blinking	OFF
100M Cable Plug-in	No Transmission	Slow Blinking	Green(Lighting)
	Transition	Swiftly Blinking	Green(Lighting)
1000M Cable Plug-in	No Transmission	Slow Blinking	Orange(Lighting)
	Transition	Swiftly Blinking	Orange(Lighting)
In S3/S4/S5 Standby State		Green (Lighting)	OFF

► Audio Ports

These audio connectors are used for audio devices. You can differentiate the color of the audio jacks for different audio sound effects.

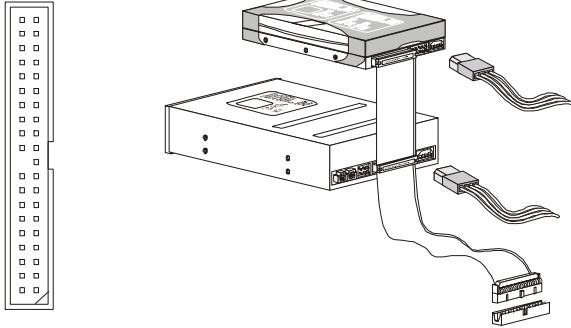
- **Line-In (Blue)** - Line In, is used for external CD player, tapeplayer or other audio devices.
- **Line-Out (Green)** - Line Out, is a connector for speakers or headphones.
- **Mic (Pink)** - Mic, is a connector for microphones.

Connector

IDE Connector: IDE1

This connector supports IDE hard disk drives, optical disk drives and other IDE devices.

IDE1



Important

If you install two IDE devices on the same cable, you must configure the drives separately to master / slave mode by setting jumpers. Refer to IDE device's documentation supplied by the vendors for jumper setting instructions.

SPI Flash ROM Pinheader: JSPI1

This pinheader is used to flash SPI flash ROM.

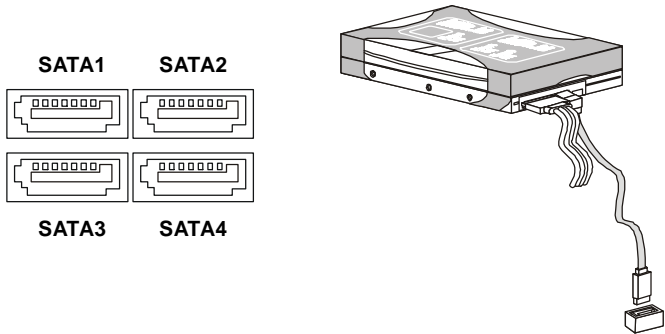


Pin Definition

Pin	Description	Pin	Description
1	VCC3_SB	2	VCC3_SB
3	SPI_MISO_F	4	SPI_MOSI_F
5	SPI_CS0_F#	6	SPI_CLK_F
7	GND	8	GND
9	SPI_HOLD#	10	NC

Serial ATA Connector: SATA1, SATA2, SATA3, SATA4

This connector is a high-speed Serial ATA interface port. Each connector can connect to one Serial ATA device.



Important

Please do not fold the Serial ATA cable into 90-degree angle. Otherwise, data loss may occur during transmission.

Serial Port Connector: COM1, COM2, COM3

This connector is a 16550A high speed communications port that sends/receives 16 bytes FIFOs. You can attach a serial device to it through the optional serial port bracket.

COM1

COM3

COM2

Pin Definition		
PIN	SIGNAL	DESCRIPTION
1	DCD	Data Carry Detect
2	SIN	Serial In or Receive Data
3	SOUT	Serial Out or Transmit Data
4	DTR	Data Terminal Ready
5	GND	Ground
6	DSR	Data Set Ready
7	RTS	Request To Send
8	CTS	Clear To Send
9	VCC_COM	Power Source

Fan Power Connector: CPUFAN1, SYSFAN1

The fan power connectors support system cooling fan with +12V. When connecting the wire to the connectors, always note that the red wire is the positive and should be connected to the +12V; the black wire is Ground and should be connected to GND. If the mainboard has a System Hardware Monitor chipset onboard, you must use a specially designed fan with speed sensor to take advantage of the CPU fan control.

CPUFAN1

SYSFAN1

FAN_PWM
FAN_RPM
+12V
GND

GND
+12V
FAN_RPM



Important

Please refer to the recommended CPU fans at CPU vendor's official website or consult the mainboard vendor for proper CPU cooling fan.

Chassis Intrusion Connector: JCI1

This connector connects to the chassis intrusion switch cable. If the chassis is opened, the chassis intrusion mechanism will be activated. The system will record this status and show a warning message on the screen. To clear the warning, you must enter the BIOS utility and clear the record.



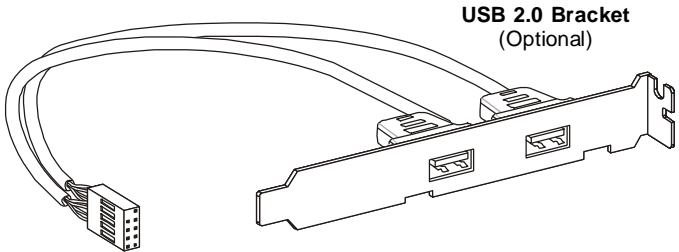
Front USB Pinheader: JUSB1

This pinheader, compliant with Intel® I/O Connectivity Design Guide, is ideal for connecting high-speed USB interface peripherals such as **USB HDD, digital cameras, MP3 players, printers, modems and the like.**

Pin Definition



PIN	SIGNAL	PIN	SIGNAL
1	VCC	2	VCC
3	USB0-	4	USB1-
5	USB0+	6	USB1+
7	GND	8	GND
9	Key (no pin)	10	USBOC

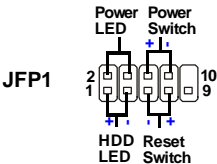


Important

Note that the pins of VCC and GND must be connected correctly to avoid possible damage.

Front Panel Connector: JFP1

The mainboard provides one front panel connector for electrical connection to the front panel switches and LEDs. The JFP1 is compliant with Intel® Front Panel I/O Connectivity Design Guide.

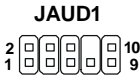


Pin Definition

PIN	SIGNAL	DESCRIPTION
1	HD_LED +	Hard disk LED pull-up
2	FPPWR/SLP	MSG LED pull-up
3	HD_LED -	Hard disk active LED
4	FPPWR/SLP	MSG LED pull-up
5	RST_SW -	Reset Switch low reference pull-down to GND
6	PWR_SW+	Power Switch high reference pull-up
7	RST_SW +	Reset Switch high reference pull-up
8	PWR_SW-	Power Switch low reference pull-down to GND
9	RSVD_DNU	Reserved. Do not use.

Front Panel Audio Connector: JAUD1

This connector allows you to connect the front panel audio and is compliant with Intel® Front Panel I/O Connectivity Design Guide.



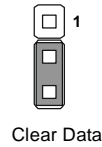
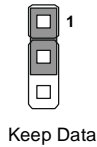
HD Audio Pin Definition

PIN	SIGNAL	DESCRIPTION
1	MIC_L	Microphone - Left channel
2	GND	Ground
3	MIC_R	Microphone - Right channel
4	PRESENCE#	Active low signal-signals BIOS that a High Definition Audio dongle is connected to the analog header. PRESENCE# = 0 when a High Definition Audio dongle is connected
5	LINE out_R	Analog Port - Right channel
6	MIC_JD	Jack detection return from front panel microphone JACK1
7	Front_JD	Jack detection sense line from the High Definition Audio CODEC jack detection resistor network
8	NC	No control
9	LINE out_L	Analog Port - Left channel
10	LINEout_JD	Jack detection return from front panel JACK2

Jumper

Clear CMOS Jumper: JBAT1

There is a CMOS RAM onboard that has a power supply from an external battery to keep the data of system configuration. With the CMOS RAM, the system can automatically boot OS every time it is turned on. If you want to clear the system configuration, set the jumper to clear data.















Important

You can clear CMOS by shorting 2-3 pin while the system is off. Then return to 1-2 pin position. Avoid clearing the CMOS while the system is on; it will damage the mainboard.

Serial Port Jumper: JCOMP1 ~ JCOMP7

These jumpers specify the operation voltage & function of the onboard serial ports.

 JCOMP1 (for COM1), JCOMP5 (for CONN1)	 +5V	 +12V
 JCOMP2 (for COM2), JCOMP7 (for CONN2 top port), JCOMP6 (for CONN2 bottom port)	 +5V	 +12V
 JCOMP3 (for COM3)	 +5V	 +12V
 JCOMP4 (for CONN1)	 POWER	 RING

Slot

PCI (Peripheral Component Interconnect) Express Slot

The CON1 is Mini PCI-E connector for wireless LAN, TV tuner, and Robson NAND Flash.



Mini PCI-E Slot

PCI (Peripheral Component Interconnect) Slot

The PCI slot supports LAN card, SCSI card, USB card, and other add-on cards that comply with PCI specifications.



32-bit PCI Slot



Important

When adding or removing expansion cards, make sure that you unplug the power supply first. Meanwhile, read the documentation for the expansion card to configure any necessary hardware or software settings for the expansion card, such as jumpers, switches or BIOS configuration.

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Chapter 3

BIOS Setup

This chapter provides information on the BIOS Setup program and allows you to configure the system for optimum use.

You may need to run the Setup program when:

- ≈ An error message appears on the screen during the system booting up, and requests you to run SETUP.
- ≈ You want to change the default settings for customized features.

Entering Setup

Power on the computer and the system will start POST (Power On Self Test) process. When the message below appears on the screen, press key to enter Setup.

Press Del to enter SETUP

If the message disappears before you respond and you still wish to enter Setup, restart the system by turning it OFF and On or pressing the RESET button. You may also restart the system by simultaneously pressing <Ctrl>, <Alt>, and <Delete> keys.



Important

1. *The items under each BIOS category described in this chapter are under continuous update for better system performance. Therefore, the description may be slightly different from the latest BIOS and should be held for reference only.*
2. *Upon boot-up, the 1st line appearing after the memory count is the BIOS version. It is usually in the format:*

A9832IMS V1.0 081508 where:

1st digit refers to BIOS maker as A = AMI, W = AWARD, and P = PHOENIX.

2nd - 5th digit refers to the model number.

6th digit refers to the chipset as I = Intel, N = nVidia, and V = VIA.

7th - 8th digit refers to the customer as MS = all standard customers.

V1.0 refers to the BIOS version.

081508 refers to the date this BIOS was released.

Control Keys

<↑>	Move to the previous item
<↓>	Move to the next item
<←>	Move to the item in the left hand
<→>	Move to the item in the right hand
<Enter>	Select the item
<Esc>	Jumps to the Exit menu or returns to the main menu from a submenu
<+/PU>	Increase the numeric value or make changes
<-/PD>	Decrease the numeric value or make changes
<F6>	Load Optimized Defaults
<F7>	Load Fail-Safe Defaults
<F10>	Save configuration changes and exit setup

Getting Help

After entering the Setup menu, the first menu you will see is the Main Menu.

Main Menu

The main menu lists the setup functions you can make changes to. You can use the arrow keys (↑↓) to select the item. The on-line description of the highlighted setup function is displayed at the bottom of the screen.

Sub-Menu

If you find a right pointer symbol (as shown in the right view) appears to the left of certain fields that means a sub-menu can be launched from this field. A sub-menu contains additional options for a field parameter. You can use arrow keys (↑↓) to highlight the field and press <Enter> to call up the sub-menu. Then you can use the control keys to enter values and move from field to field within a sub-menu. If you want to return to the main menu, just press the <Esc>.

▶ IDE Primary Master
▶ IDE Primary Slave

General Help <F1>

The BIOS setup program provides a General Help screen. You can call up this screen from any menu by simply pressing <F1>. The Help screen lists the appropriate keys to use and the possible selections for the highlighted item. Press <Esc> to exit the Help screen.

The Main Menu



► Standard CMOS Features

Use this menu for basic system configurations, such as time, date etc.

► Advanced BIOS Features

Use this menu to setup the items of AMI® special enhanced features.

► Integrated Peripherals

Use this menu to specify your settings for integrated peripherals.

► Power Management Setup

Use this menu to specify your settings for power management.

► PnP/PCI Configurations

Use this menu to specify PnP/PCI settings.

► H/W Monitor

This entry shows your PC health status.

► Load Fail-Safe Defaults

Use this menu to load the default values set by the BIOS vendor for stable system performance.

► **Load Optimized Defaults**

Use this menu to load the default values set by the mainboard manufacturer specifically for optimal performance of the mainboard.

► **BIOS Setting Password**

Use this menu to set the password for BIOS.

► **Save & Exit Setup**

Save changes to CMOS and exit setup.

► **Exit Without Saving**

Abandon all changes and exit setup.

Standard CMOS Features

CMOS Setup Utility - Copyright (C) 1985-2005, American Megatrends, Inc. Standard CMOS Features		
Date (MM:DD:YY) :	[Sat 01/05/2002]	Help Item
Time (HH:MM:SS) :	[12:36:00]	Use [ENTER], [TAB] or [SHIFT-TAB] to select a field.
ATA/IDE Configuration	[Enhanced]	Use [+] or [-] to configure system Date
▶ IDE Primary Master	[Not Detected]	
▶ IDE Primary Slave	[Not Detected]	
▶ SATA1	[Not Detected]	
▶ SATA2	[Not Detected]	
▶ SATA3	[Not Detected]	
▶ SATA4	[Not Detected]	
Halt on	[All,ButKeyboard]	
▶ System Information	[Press Enter]	
↑←→:Move Enter:Select +/-:Value F10:Save ESC:Exit F1:General Help F6:Load Optimized Defaults		

► Date (MM:DD:YY)

This allows you to set the system to the date that you want (usually the current date). The format is <day> <month> <date> <year>.

day	Day of the week, from Sun to Sat, determined by BIOS. Read-only.
month	The month from Jan. through Dec.
date	The date from 1 to 31 can be keyed by numeric function keys.
year	The year can be adjusted by users.

► Time (HH:MM:SS)

This allows you to set the system time that you want (usually the current time). The time format is <hour> <minute> <second>.

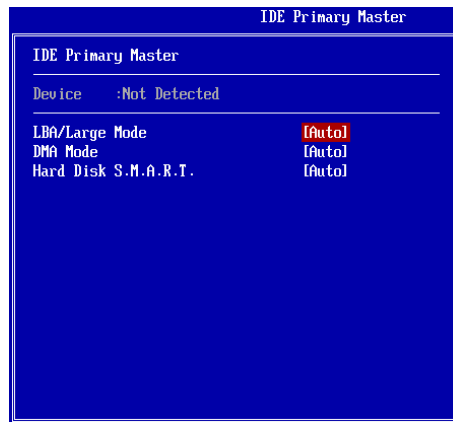
► ATA/IDE Configuration

This setting specifies the operation mode of the ATA/IDE device.

► IDE Primary Master/Slave, SATA1/2/3/4

**Important**

*The **IDE Primary Master/Slave, SATA1/2/3/4** items appear when you connect hard disk drives to the IDE/SATA connector on the mainboard.*

► **Device, Vender, Size**

These settings show the IDE/SATA device information. Read only.

► **LBA/Large Mode**

This setting allows you to enable or disable the LBA Mode. Setting to [Auto] enables LBA mode if the device supports it and has not been formatted with LBA mode disabled.

► **DMA Mode**

This setting specifies the DMA Mode.

► **Hard Disk S.M.A.R.T.**

This setting allows you to activate the S.M.A.R.T. (Self-Monitoring Analysis & Reporting Technology) capability for the hard disk drives. S.M.A.R.T. is a utility that monitors your disk status to predict hard disk failure. This gives you an opportunity to move data from a hard disk that is going to fail to a safe place before the hard disk becomes off-line.

► Halt On

The setting determines whether the system will stop if an error is detected at boot. When the system stops for the errors preset, it will halt on for 15 seconds and then automatically resume its operation.

► System Information

These items show the CPU information, BIOS version and memory status of your system. Read only.

System Information		
Genuine Intel(R) CPU	230	@ 1.60GHz
CPUID/MicroCode	06C2h/0204h	
CPU Frequency	1600MHz	
BIOS Version	V1.0B 08122008	
Physical Memory	256MB	
Usage Memory	240MB	
Cache Size	512 KB	

Advanced BIOS Features



► Boot Sector Protection

The item is to set the Virus Warning feature for IDE Hard Disk boot sector protection. If the function is enabled and any attempt to write data into this area is made, BIOS will display a warning message on screen and beep.

► Quick Booting

Setting the item to [Enabled] allows the system to boot within 5 seconds since it will skip some check items.

► Boot Up Num-Lock LED

This setting is to set the Num Lock status when the system is powered on. Setting to [On] will turn on the Num Lock key when the system is powered on. Setting to [Off] will allow users to use the arrow keys on the numeric keypad.

► IOAPIC Function

This field is used to enable or disable the APIC (Advanced Programmable Interrupt Controller). Due to compliance with PC2001 design guide, the system is able to run in APIC mode. Enabling APIC mode will expand available IRQ resources for the system.

► MPS Table Version

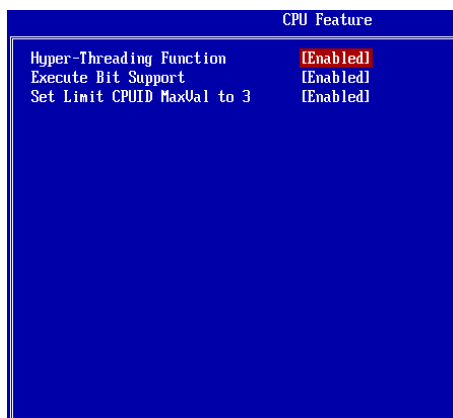
This field allows you to select which MPS (Multi-Processor Specification) version to be used for the operating system. You need to select the MPS version supported by

your operating system. To find out which version to use, consult the vendor of your operating system.

► Flash Write Protection

This function protects the BIOS from accidental corruption by unauthorized users or computer viruses.

► CPU Feature



► Hyper-Threading Function

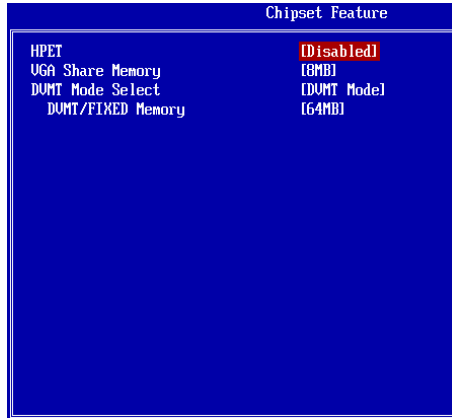
The processor uses Hyper-Threading technology to increase transaction rates and reduces end-user response times. The technology treats the two cores inside the processor as two logical processors that can execute instructions simultaneously. In this way, the system performance is highly improved. If you disable the function, the processor will use only one core to execute the instructions. ***Please disable this item if your operating system doesn't support HT Function, or unreliability and instability may occur.***

► Execute Bit Support

Intel's Execute Disable Bit functionality can prevent certain classes of malicious "buffer overflow" attacks when combined with a supporting operating system. This functionality allows the processor to classify areas in memory by where application code can execute and where it cannot. When a malicious worm attempts to insert code in the buffer, the processor disables code execution, preventing damage or worm propagation.

► Set Limit CPUID MaxVal to 3

This setting sets Max CPUID extended function value to 3.

► Chipset Feature**► HPET**

The High Precision Event Timer (HPET) was developed jointly by Intel and Microsoft to meet the timing requirements of multimedia and other time-sensitive applications. In addition to extending the capabilities and precision of a system, the HPET also improves system performance.

► VGA Share Memory

The system shares memory to the onboard VGA card. This setting controls the exact memory size shared to the VGA card.

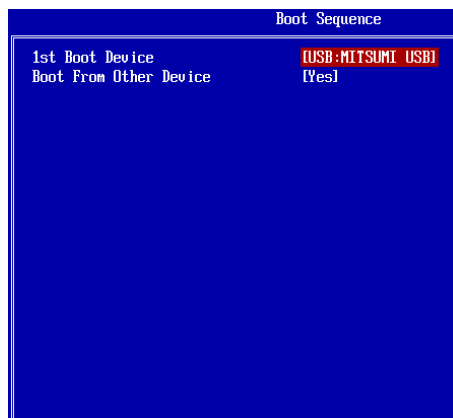
► DVMT Mode Select

Intel's Dynamic Video Memory Technology (DVMT) allows the system to dynamically allocate memory resources according to the demands of the system at any point in time. The key idea in DVMT is to improve the efficiency of the memory allocated to either system or graphics processor.

It is recommended that you set this BIOS feature to DVMT Mode for maximum performance. Setting it to DVMT Mode ensures that system memory is dynamically allocated for optimal balance between graphics and system performance.

► DVMT/FIXED Memory

When set to DVMT/FIXED Mode, the graphics driver will allocate a fixed amount of memory as dedicated graphics memory, as well as allow more system memory to be dynamically allocated between the graphics processor and the operating system.

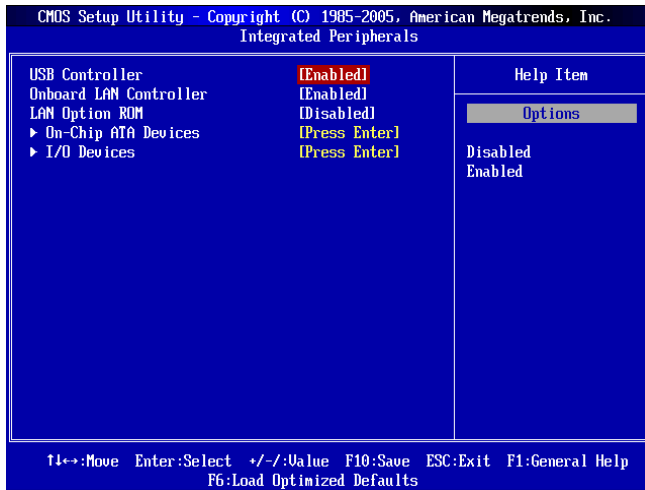
► Boot Sequence**► 1st Boot Device**

The items allow you to set the first boot device where BIOS attempts to load the disk operating system.

► Boot From Other Device

Setting the option to [Yes] allows the system to try to boot from other device. if the system fails to boot from the 1st boot device.

Integrated Peripherals



► USB Controller

This setting allows you to enable/disable the onboard USB 1.1/ 2.0 controller.

► Onboard LAN Controller

This setting allows you to enable/disable the onboard LAN controller.

► LAN Option ROM

The items enable or disable the initialization of the onboard LAN Boot ROM during bootup. Selecting [Disabled] will speed up the boot process.

► On-Chip ATA Devices

On-Chip ATA Devices	
On-Chip IDE Controller	[Enabled]
PCI IDE BusMaster	[Disabled]
On-Chip SATA Controller	[Enabled]

► On-Chip IDE Controller

This setting enables/disables the onchip IDE controller.

► PCI IDE BusMaster

Set this option to [Enabled] to specify that the IDE controller on the PCI local bus has bus mastering capability.

► On-Chip SATA Controller

This setting enables/disables the onchip SATA controller.

► I/O Devices

I/O Devices	
COM Port 1	[3F8/IRQ4]
COM Port1 Mode	[RS232]
COM Port 2	[2F8/IRQ3]
Serial Port3 Address	[2E0]
Serial Port3 IRQ	[3]
Serial Port4 Address	[2F0]
Serial Port4 IRQ	[4]
Serial Port5 Address	[3E0]
Serial Port5 IRQ	[5]
Serial Port6 Address	[2E0]
Serial Port6 IRQ	[9]
Watch Dog	[Disabled]

► COM Port 1, COM Port1 Mode, COM Port 2, Serial Port 3/ 4/ 5/ 6 Address, Serial Port 3/ 4/ 5/ 6 IRQ

These settings specify the base I/O port address and IRQ resource of the onboard serial ports.

► Watch Dog

You can enable the system watch-dog timer, a hardware timer that generates either an NMI or a reset when the software that it monitors does not respond as expected each time the watch dog polls it.

Power Management Setup

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Power Management Setup

		Help Item
ACPI Function	[Enabled]	
ACPI Standby State	[S3]	
Re-call VGA BIOS from S3	[Disabled]	Enable / Disable
Suspend Time Out (Minute)	[Disabled]	ACPI support for
Power Button Function	[Power Off]	Operating System.
Restore On AC Power Loss	[Off]	
▶ Wake Up Event Setup	[Press Enter]	ENABLE: If OS
		supports ACPI.
		DISABLE: If OS
		does not support
		ACPI.

F1←→:Move Enter:Select +/=:Value F10:Save ESC:Exit F1:General Help
F6:Load Optimized Defaults



Important

S3-related functions described in this section are available only when your BIOS supports S3 sleep mode.

▶ ACPI Function

This item is to activate the ACPI (Advanced Configuration and Power Management Interface) Function. If your operating system is ACPI-aware, such as Windows 98SE/ 2000/ME/ XP, select [Enabled].

▶ ACPI Standby State

This item specifies the power saving modes for ACPI function. If your operating system supports ACPI, such as Windows 2000/ XP, you can choose to enter the Standby mode in S1(POS) or S3(STR) fashion through the setting of this field. Settings are:

- [S1] The S1 sleep mode is a low power state. In this state, no system context is lost (CPU or chipset) and hardware maintains all system context.
- [S3] The S3 sleep mode is a lower power state where the information of system configuration and open applications/files

is saved to main memory that remains powered while most other hardware components turn off to save energy. The information stored in memory will be used to restore the system when a “wake up” event occurs.

► **Recall VGA BIOS from S3**

Selecting [Enabled] will make BIOS call VGA BIOS to initialize the VGA card when system wakes up (resume) from S3 state. The system resume time is shortened if you disable the function, but system will need AGP driver to initialize the card. Therefore, if the AGP driver of the VGA card does not support the initialization feature, the display may work abnormally or not function after resuming from S3.

► **Suspend Time Out (Minute)**

After the selected period of system inactivity, the system automatically enters Suspend mode.

► **Power Button Function**

This feature sets the function of the power button. Settings are:

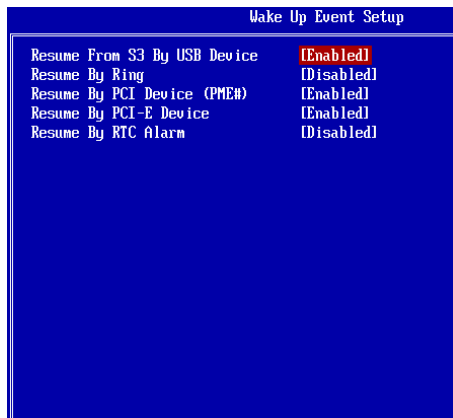
- | | |
|----------------|---|
| [Power On/Off] | The power button functions as normal power on/off button. |
| [Suspend] | When you press the power button, the computer enters the suspend/sleep mode, but if the button is pressed for more than four seconds, the computer is turned off. |

► **Restore on AC Power Loss**

This item specifies whether your system will reboot after a power failure or interrupt occurs. Settings are:

- | | |
|--------------|---|
| [Off] | Always leaves the computer in the power off state. |
| [On] | Always leaves the computer in the power on state. |
| [Last State] | Restores the system to the status before power failure or interrupt occurred. |

► Wake Up Event Setup



► Resume From S3 By USB Device

The item allows the activity of the USB device to wake up the system from S3 (Suspend to RAM) sleep state.

► Resume By Ring

When it is set to [Enabled], the feature allows your system to support COM port Modem to resume.

► Resume By PCI Device (PME#)

When set to [Enabled], the feature allows your system to be awakened from the power saving modes through any event on PME (Power Management Event).

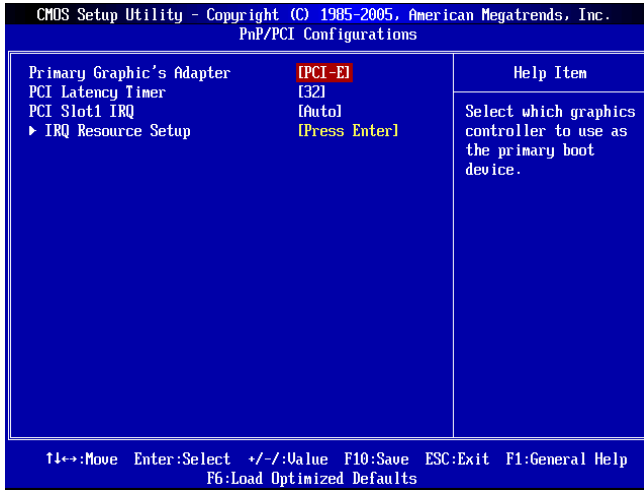
► Resume By PCI-E Device

When set to [Enabled], the feature allows your system to be awakened from the power saving modes through any event on PCIE device.

► Resume By RTC Alarm

The field is used to enable or disable the feature of booting up the system on a scheduled time/date.

PnP/PCI Configurations



► Primary Graphic's Adapter

This setting specifies which graphic card is your primary graphics adapter.

► PCI Latency Timer

This item controls how long each PCI device can hold the bus before another takes over. When set to higher values, every PCI device can conduct transactions for a longer time and thus improve the effective PCI bandwidth. For better PCI performance, you should set the item to higher values.

► PCI Slot1 IRQ

This setting specifies the IRQ of the PCI slot 1.

► IRQ Resource Setup

IRQ Resource Setup	
IRQ3	[Available]
IRQ4	[Available]
IRQ5	[Available]
IRQ7	[Available]
IRQ9	[Available]
IRQ10	[Available]
IRQ11	[Available]
IRQ14	[Available]
IRQ15	[Available]

► IRQ 3/4/5/7/9/10/11/14/15

These items specify the bus where the specified IRQ line is used.

The settings determine if AMIBIOS should remove an IRQ from the pool of available IRQs passed to devices that are configurable by the system BIOS. The available IRQ pool is determined by reading the ESCD NVRAM. If more IRQs must be removed from the IRQ pool, the end user can use these settings to reserve the IRQ by assigning an [Reserved] setting to it. Onboard I/O is configured by AMIBIOS. All IRQs used by onboard I/O are configured as [Available]. If all IRQs are set to [Reserved], and IRQ 14/15 are allocated to the onboard PCI IDE, IRQ 9 will still be available for PCI and PnP devices.

H/W Monitor

CMOS Setup Utility - Copyright (C) 1985-2005, American Megatrends, Inc.		
H/W Monitor		
Chassis Intrusion	[Disabled]	Help Item
CPU Smart FAN Target	[40°C]	Options
CPU Min. FAN Speed (%)	[62.5]	
---- PC Health Status ----		Disabled
CPU Temperature	: 43°C/109°F	40°C
System Temperature	: 41°C/105°F	45°C
CPU FAN Speed	: N/A	50°C
SYS FAN Speed	: N/A	55°C
CPU Vcore	: 1.176 V	60°C
3.3V	: 3.440 V	65°C
5V	: 5.255 V	70°C
12V	: 12.144 V	
USB	: 3.440 V	
VBAT	: 3.456 V	
F1←→:Move Enter:Select +/=:Value F10:Save ESC:Exit F1:General Help F6:Load Optimized Defaults		

► Chassis Intrusion

The field enables or disables the feature of recording the chassis intrusion status and issuing a warning message if the chassis is once opened. To clear the warning message, set the field to [Reset]. The setting of the field will automatically return to [Enabled] later.

► CPU Smart FAN Target

The mainboard provides the Smart Fan function which can control the CPU fan speed automatically depending on the current temperature to keep it within a specific range. You can select a fan target value here. If the current CPU fan temperature reaches to the target value, the smart fan function will be activated. It provides several sections to speed up for cooling down automatically.

► CPU Min. FAN Speed (%)

This setting controls the minimum CPU fan speed for the Smart Fan function.

► PC Health Status

► CPU/System Temperature, CPU/SYS FAN Speed, CPU Vcore, 3.3V, 5V, 12V, VSB, VBAT

These items display the current status of all of the monitored hardware devices/components such as CPU voltage, temperatures and all fans' speeds.

Load Fail-Safe / Optimized Defaults

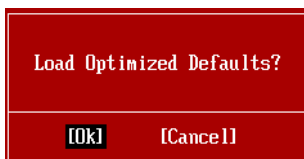
The two options on the main menu allow users to restore all of the BIOS settings to the default Fail-Safe or Optimized values. The Optimized Defaults are the default values set by the mainboard manufacturer specifically for optimal performance of the mainboard. The Fail-Safe Defaults are the default values set by the BIOS vendor for stable system performance.

When you select Load Fail-Safe Defaults, a message as below appears:



Selecting Ok and pressing <Enter> loads the BIOS default values for the most stable, minimal system performance.

When you select Load Optimized Defaults, a message as below appears:



Selecting Ok and pressing <Enter> loads the default factory settings for optimal system performance.

BIOS Setting Password

When you select this function, a message as below will appear on the screen:



Enter New Password

Type the password, up to six characters in length, and press <Enter>. The password typed now will replace any previously set password from CMOS memory. You will be prompted to confirm the password. Retype the password and press <Enter>. You may also press <Esc> to abort the selection and not enter a password.

To clear a set password, just press <Enter> when you are prompted to enter the password. A message will show up confirming the password will be disabled. Once the password is disabled, the system will boot and you can enter Setup without entering any password.

When a password has been set, you will be prompted to enter it every time you try to enter Setup. This prevents an unauthorized person from changing any part of your system configuration.

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Chapter 4

System Resources

This chapter provides information on the following system resources:

1. Watch Dog Timer Setting (p.4-2);
2. AMI POST Code (p.4-3);
3. Resource List (p.4-7).

Watch Dog Timer Setting

Software Code

SIO_IDX equ 4EH

SIO_DTA equ 4FH

Timer equ 10; reset after 10 seconds

1. Enter configuration mode

```
Mov      dx, SIO_IDX
mov      al, 87h
out      dx, al
out      dx, al
```

2. Set to LDN 07

```
Mov      dx, SIO_IDX
mov      al, 07h
out      dx, al
mov      dx, SIO_DTA
mov      al, 07h
out      dx, al
```

3. Set WatchDog Timer

```
Mov      dx, SIO_IDX
mov      al, 0f6h
out      dx, al
mov      dx, SIO_DTA
mov      al, Timer
out      dx, al
```

4. Exit configuration mode

```
Mov      dx, SIO_IDX
mov      al, 0AAh
out      dx, al
```

AMI POST Code

Bootblock Recovery Code Checkpoints

The Bootblock recovery code gets control when the BIOS determines that a BIOS recovery needs to occur because the user has forced the update or the BIOS checksum is corrupt. The following table describes the type of checkpoints that may occur during the Bootblock recovery portion of the BIOS:

Checkpoint	Description
E0	Initialize the floppy controller in the super I/O. Some interrupt vectors are initialized. DMA controller is initialized. 8259 interrupt controller is initialized. L1 cache is enabled.
E9	Set up floppy controller and data. Attempt to read from floppy.
EA	Enable ATAPI hardware. Attempt to read from ARMD and ATAPI CDROM.
EB	Disable ATAPI hardware. Jump back to checkpoint E9.
EF	Read error occurred on media. Jump back to checkpoint EB.
E9 or EA	Determine information about root directory of recovery media.
F0	Search for pre-defined recovery file name in root directory.
F1	Recovery file not found.
F2	Start reading FAT table and analyze FAT to find the clusters occupied by the recovery file.
F3	Start reading the recovery file cluster by cluster.
F5	Disable L1 cache.
FA	Check the validity of the recovery file configuration to the current configuration of the flash part.
FB	Make flash write enabled through chipset and OEM specific method. Detect proper flash part. Verify that the found flash part size equals the recovery file size.
F4	The recovery file size does not equal the found flash part size.
FC	Erase the flash part.
FD	Program the flash part.
FF	The flash has been updated successfully. Make flash write disabled. Disable ATAPI hardware. Restore CPUID value back into register. Give control to F000 ROM at F000:FFF0h.

POST Code Checkpoints

The POST code checkpoints are the largest set of checkpoints during the BIOS pre-boot process. The following table describes the type of checkpoints that may occur during the POST portion of the BIOS:

Checkpoint	Description
03	Disable NMI, Parity, video for EGA, and DMA controllers. Initialize BIOS, POST, Runtime data area. Also initialize BIOS modules on POST entry and GPNV area. Initialize CMOS as mentioned in the Kernel Variable "wCMOSFlags."
04	Check CMOS diagnostic byte to determine if battery power is OK and CMOS checksum is OK. Verify CMOS checksum manually by reading storage area. If the CMOS checksum is bad, update CMOS with power-on default values and clear passwords. Initialize status register A. Initializes data variables that are based on CMOS setup questions. Initializes both the 8259 compatible PICs in the system
05	Initializes the interrupt controlling hardware (generally PIC) and interrupt vector table.
06	Do R/W test to CH-2 count reg. Initialize CH-0 as system timer. Install the POSTINT1Ch handler. Enable IRQ-0 in PIC for system timer interrupt. Traps INT1Ch vector to "POSTINT1ChHandlerBlock."
08	Initializes the CPU. The BAT test is being done on KBC. Program the keyboard controller command byte is being done after Auto detection of KB/MS using AMI KB-5.
0A	Initializes the 8042 compatible Key Board Controller.
0B	Detects the presence of PS/2 mouse.
0C	Detects the presence of Keyboard in KBC port.
0E	Testing and initialization of different Input Devices. Also, update the Kernel Variables. Traps the INT09h vector, so that the POST INT09h handler gets control for IRQ1. Uncompress all available language, BIOS logo, and Silent logo modules.

Checkpoint	Description
13	Early POST initialization of chipset registers.
24	Uncompress and initialize any platform specific BIOS modules.
30	Initialize System Management Interrupt.
2A	Initializes different devices through DIM. See <i>DIM Code Checkpoints</i> section of document for more information.
2C	Initializes different devices. Detects and initializes the video adapter installed in the system that have optional ROMs.
2E	Initializes all the output devices.
31	Allocate memory for ADM module and uncompress it. Give control to ADM module for initialization. Initialize language and font modules for ADM. Activate ADM module.
33	Initializes the silent boot module. Set the window for displaying text information.
37	Displaying sign-on message, CPU information, setup key message, and any OEM specific information.
38	Initializes different devices through DIM. See <i>DIM Code Checkpoints</i> section of document for more information.
39	Initializes DMAC-1 & DMAC-2.
3A	Initialize RTC date/time.
3B	Test for total memory installed in the system. Also, Check for DEL or ESC keys to limit memory test. Display total memory in the system.
3C	Mid POST initialization of chipset registers.
40	Detect different devices (Parallel ports, serial ports, and coprocessor in CPU, ... etc.) successfully installed in the system and update the BDA, EBDA...etc.
50	Programming the memory hole or any kind of implementation that needs an adjustment in system RAM size if needed.
52	Updates CMOS memory size from memory found in memory test. Allocates memory for Extended BIOS Data Area from base memory.
60	Initializes NUM-LOCK status and programs the KBD typematic rate.
75	Initialize Int-13 and prepare for IPL detection.
78	Initializes IPL devices controlled by BIOS and option ROMs.
7A	Initializes remaining option ROMs.
7C	Generate and write contents of ESCD in NVRam.
84	Log errors encountered during POST.
85	Display errors to the user and gets the user response for error.
87	Execute BIOS setup if needed / requested.
8C	Late POST initialization of chipset registers.
8E	Program the peripheral parameters. Enable/Disable NMI as selected
90	Late POST initialization of system management interrupt.
A0	Check boot password if installed.
A1	Clean-up work needed before booting to OS.
A2	Takes care of runtime image preparation for different BIOS modules. Fill the free area in F000h segment with 0FFh.

	Initializes the Microsoft IRQ Routing Table. Prepares the runtime language module. Disables the system configuration display if needed.
A4	Initialize runtime language module.
A7	Displays the system configuration screen if enabled. Initialize the CPU's before boot, which includes the programming of the MTRR's.
A8	Prepare CPU for OS boot including final MTRR values.
A9	Wait for user input at config display if needed.
AA	Uninstall POST INT1Ch vector and INT09h vector. Deinitializes the ADM module.
AB	Prepare BBS for Int 19 boot.
AC	End of POST initialization of chipset registers.
B1	Save system context for ACPI.
00	Passes control to OS Loader (typically INT19h).

Resource List

ICH7 GPIO

PIN	GPIO	TYPE	MULTI	POWER	CONNECTION
AB18	0	I/O	Unmultiplexed#	3.3v	GPIO0(pull high)
C8	1	I/O	REQ5#	5v	PREQ#5
G8	2	I/OD	PIRQE#	5v	GPIO2(pull high)
F7	3	I/OD	PIRQF#	5v	GPIO3(pull high)
F8	4	I/OD	PIRQG#	5v	GPIO4(pull high)
G7	5	I/OD	PIRQH#	5v	GPIO5(pull high)
AC21	6	I/O	Unmultiplexed	3.3v	ATADET0
AC18	7	I/O	CLEAR CMOS	3.3v	GPIO7(pull high)
E21	8	I/O	Unmultiplexed	3.3v	POWER LED SW
E20	9	I/O	Unmultiplexed	3.3v	GPIO9(pull high)
A20	10	I/O	Unmultiplexed	3.3v	GPIO10(pull high)
B23	11	I/O	SMBALERT#	3.3v	SMB_ALERT#
F19	12	I/O	Unmultiplexed	3.3v	SIO_PME#
E19	13	I/O	Unmultiplexed	3.3v	GPIO13(pull high)
R4	14	I/O	Unmultiplexed	3.3v	GPIO14(pull high)
E22	15	I/O	Unmultiplexed	3.3v	GPIO15(pull high)
AC22	16	I/O	Unmultiplexed	3.3v	GPIO16(INTERNAL HI)
D8	17	I/O	GNT5#	3.3v	PGNT5#
AC20	18	I/O	Unmultiplexed	3.3v	NC
AH18	19	I/O	SATA_1GP	3.3v	PULL HIGH
AF21	20	I/O	Unmultiplexed	3.3v	NC
AF19	21	I/O	SATA_0GP	3.3v	PULL HIGH
A13	22	I/O	REQ4#	3.3v	PREQ#4
AA5	23	I/O	LDRQ_1#	3.3v	TEST POINT
R3	24	I/O	Unmultiplexed	3.3v	BIOS_WP#
D20	25	I/O	Unmultiplexed	3.3v	DMI STRAP
A21	26	I/O	Unmultiplexed	3.3v	WLAN_PWRON
B21	27	I/O	Unmultiplexed	3.3v	TEST POINT
E23	28	I/O	Unmultiplexed	3.3v	NC
C3	29	I/O	OC5#	3.3v	USB_OCP#2

PIN	GPIO	TYPE	MULTI	POWER	CONNECTION
A2	30	I/O	OC6#	3.3v	USB_OCP#3
B3	31	I/O	OC7#	3.3v	USB_OCP#3
AG18	32	I/O	Unmultiplexed	3.3v	NC
AC19	33	I/O	Unmultiplexed	3.3v	NC
U2	34	I/O	Unmultiplexed	3.3v	NC
AD21	35	I/O	SATACLKREQ#	3.3v	PULL HIGH
AH19	36	I/O	SATA2GP	3.3v	PULL HIGH
AE19	37	I/O	SATA3GP	3.3v	PULL HIGH
AD20	38	I/O	Unmultiplexed	3.3v	GPIO38 (pull high)
AE20	39	I/O	Unmultiplexed	3.3v	GPIO39 (pull high)
A14	48	I/O	GNT4#	3.3v	PGNT4(INTERNAL HI)
AG24	49	I/O	CPUPWRGD	3.3v	H_PWRGD

SIO GPIO

PIN	GPIO	TYPE	MULTI	POWER	CONNECTION
55	6	I/OD12t	SLOT0CC#	VSB	SLOT0CC#
60	11	OD12	GPIO11	VSB	MB_ID0
61	12	OD12	GPIO12	VSB	MB_ID1
64	15	OD12	LED_VSB/ALERT#	VSB	LED_VSB
65	16	OD12	LED_VCC/Turbo2#	VSB	LED_VCC
75	21	O12	PCIRST2#	VSB	PLTRST_BU2#
76	22	O12	PCIRST3#	VSB	PLTRST_BU3#
77	23	OD12	RSTCON#	VSB	RSTCON#
79	25	OD12-5v	PME#	VSB	PME#
78	24	AIN	ATXPG_IN	VSB	ATX_PWR_OK
84	32	OD12	PWROK	VSB	SIO_PWOK
80	26	INts5v	PWSIN#	VSB	PSIN#
81	27	OD12	PWSOUT#	VSB	PSOUT#
82	30	INts5v	S3#	VSB	SLP_S3#
83	31	OD12-5v	PSON#	VSB	PSON#
85	33	OD12	RSMRST#	VSB	RSMRST#
28	43	INts	IRRX	VSB	#EN422
56	7	OD12-5v	Turbo1#/WDTRST#	VSB	WDTRST#
84	32	OD	PWROK	VSB	SIO_PWOK
27	42	I/OD12t	IRTX	VCC	EN232
66	17	I/OD12t	GPIO17	VSB	#EN485